PATENT SPECIFICATION

DRAWINGS ATTACHED

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874,728

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International Classification:—B61f.

COMPLETE SPECIFICATION

Improvements in and relating to Vehicle Suspension

We, GEORGE SPENCER MOULTON & COMPANY LIMITED, of Mauvers House, Bradford-on-Avon, Wiltshire, formerly of 13 & 14, Ashley Place, Westminster, London, S.W.1, and DISTINGTON ENGINEERING COMPANY LIMITED, of Workington, in the County of Cumberland, both Bodies Corporate, duly organised under the Laws of Great Britain, do hereby declare this invention, for which we pray that a patent may be granted to us and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to vehicle suspensions and has more especial reference to rubber spring suspensions for railway and like vehicles the wheels of which are bridged by axles.

In British Patent Specification No. 791,864 an improved wheel suspension or axle mounting is described in which inclined rubber shear sandwiches are disposed fore and aft the axle between correspondingly inclined horn blocks carrying the vehicle structure and the inner support member is of general inverted V-shape closed at its upper end, the axle, axlebox or bearing being adapted to be fitted therein by relative upward movement and thereafter secured in place by a member bridging the trough at the bottom of the V-shaped member.

The embodiment described in the aforementioned Specification No. 791,864 referred to an arrangement having square or rectangular dead axles bridging the wheels and the present invention provides an improved arrangement of vehicle suspension especially suitable where circular section axles are employed.

In accordance with the present invention a resilient suspension for mounting an axle on a vehicle comprises a pair of inclined rubber shear pads, one disposed in front of and one behind the axle and bonded between inclined horn blocks carrying the vehicle, and the inclined edges of an inverted, generally V-shaped block suitably of mild steel or a drop stamping having an aperture through which the axle passes, wherein the horn blocks are welded to a short top sill and reinforced with generally triangular fillets welded in place, the top sill being provided with upwardly projecting bolts or studs by which the suspension may be attached to the vehicle frame.

The block generally conforms exteriorally with the shape of the inverted V-shaped support described in the aforementioned specification and for a circular axle, has a machined circular cylindrical aperture passing the wheel axle. Each rubber shear element has one face bonded to an inner support welded to the inverted V-shaped block and an opposite face bonded to its respective horn block or outer support.

Preferably also, the inverted V-shaped block is of truncated form having a flat surface at the top between its upwardly convergent edges and projecting upwardly from this flat top is a circular pin riding in a corresponding aperture in the top sill so as to serve the dual function of supplementing the pads in laterally and longitudinally locating the suspension unit in relation to the vehicle.

The invention will be further described with reference to the accompanying explanatory drawings which illustrate one embodiment of combined wheel suspension and axle mounting by way of example and in which:—

Figure 1 is a side elevational view of the suspension and mounting, while Figure 2 is a vertical section on the line II—II of Figure 1, and Figure 3 is a detailed section on the line III—III of Figure 1 showing one of the rubber shear sandwiches.

Referring now to the drawings, a pair of

inclined rubber shear pads 1 and 2 are disposed fore and aft a cylindrical axle 3 of circular section which is housed in a circular cylindrical aperture 4 in an inverted, generally V-shaped block 5, the axle 3 supporting a flanged wheel 6 which runs on rails.

Inner supports 7 and 8 are welded to the inclined edges of the inverted V-shaped block 5 and correspondingly inclined horn blocks or outer supports 9 and 10 are welded to a top sill 11 and reinforced with generally triangular fillets 12 for the support 9 and 14 and 15 for the support 10 welded in place as shown in Figure 3, the rubber shear pads 1 and 2 being bonded to the interfaces of the respective pairs of inner and outer supports 7 and 9, and 8 and 10. The top sill 11 is provided with upwardly projecting studs or bolts 16 through the medium of which the suspension is secured to the vehicle chassis or frame 17 by nuts 18.

The inverted V-shaped block 5 has an upwardly projecting circular pin 19 riding in an aperture 20 in the top sill 11 and a corresponding aperture 21 in the vehicle chassis of frame 17 to supplement the pads in locating the suspension in relation to the vehicle.

After welding the horn blocks 9 and 10, and triangular fillets 12, 14 and 15 to the top sill 11, and the inner supports 7 and 8 to the inclined edges of the inverted V-shaped block 5, these components are jigged in a mould, and the rubber shear pads 1 and 2 are positioned and are cured and bonded to the interfaces of their respective inner and outer supports.

As will be seen from Figure 3 the inner and outer supports 8 and 10 provide an extended transverse surface in bonded contact with the rubber element or pad 1.

It will be appreciated that where increased load bearing capacity and stability are required, the rubber element may be laminated, successive laminations being bonded at other interfaces to metal or other plates.

By the present invention an improved axle mounting and suspension for vehicles is obtained.

WHAT WE CLAIM IS:—

1. A resilient suspension for mounting an axle on a vehicle wherein a pair of inclined rubber shear pads, one disposed in front of and one behind the axle and bonded between inclined horn blocks carrying the vehicle, and the inclined edges of an inverted, generally V-shaped block suitably of mild steel or a drop stamping having an aperture through which the axle passes, wherein the horn blocks are welded to a short top sill and reinforced with generally triangular fillets welded in place, the top sill being provided with upwardly projecting bolts or studs by which the suspension may be attached to the vehicle frame.

2. A resilient suspension for mounting an axle on a vehicle according to the preceding claim wherein intermediate supports are welded to the inclined edges of the inverted V-shaped block to afford an increase in surface area and the use of correspondingly wider shear pads.

3. A resilient suspension for mounting an axle on a vehicle according to the preceding Claim 1 or 2 wherein the inverted V-shaped block is of truncated form having a flat surface at the top between its upwardly convergent edges, and a circular pin projecting upwardly from the flat top that rides in a corresponding aperture in the top sill to supplement the pads in locating the suspension.

4. A resilient suspension for mounting an axle on a vehicle substantially as described with reference to the accompanying drawings.

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PROVISIONAL SPECIFICATION

Improvements in and relating to Vehicle Suspension

We, GEORGE SPENCER MOULTON & COMPANY LIMITED, of 13 & 14, Ashley Place, Westminster, London, S.W.1, and DISTINGTON ENGINEERING COMPANY LIMITED, of Workington, in the County of Cumberland, both Bodies Corporate, organised under the Laws of Great Britain, do hereby declare this invention to be described in the following statement:—

This invention relates to vehicle suspensions and has more especial reference to rubber spring suspensions for railway and like vehicles the wheels of which are bridged by axles.

In the Specification of co-pending Application No. 19757/54 (Serial No. 791,864) an improved wheel suspension or axle mounting is described in which inclined rubber shear sandwiches are disposed fore and aft the axle between correspondingly inclined horn blocks carrying the vehicle structure and the inner support member is of general inverted V-shape, closed at its upper end, the axle, axle-box or bearing being adapted to be fitted therein by relative upward movement and thereafter secured in place by a member, bridging the trough at the bottom of the V-shaped member.

The embodiment described in the aforementioned co-pending Application No. 19757/54 (Serial No. 791,864) referred to an arrangement having square or rectangular dead axles bridging the wheels, and the present invention provides an improved arrangement of vehicle suspension especially suitable where circular section axles are employed.

In accordance with the present invention, the inclined horn blocks carrying the vehicle structure are again employed as are the inclined rubber shear sandwiches disposed fore and aft the axle, but in place of the axle or axle box being held in place by a member bridging the trough at the bottom of the V-shaped member, a generally inverted V-shaped block suitably of mild steel or a drop stamping is employed to house the axle. This block generally conforms exteriorally with the exterior shape of the inverted V-shaped support described in the co-pending application and has a machined circular cylindrical aperture passing the wheel axle. Each rubber shear element has one face bonded to the inner support and an opposite face bonded to its respective horn block.

The horn blocks are also conveniently fabricated from mild steel plate welded to a short top sill and reinforced with generally triangular fillets welded in place, the top sill being provided with upwardly projecting studs or bolts by which the suspension is secured in position on the vehicle structure; alternatively the whole of the exterior member of the suspension unit may be cast as one piece.

Preferably also, the inner support member is of truncated V-shape having a flat surface at the top between its divergent limbs and projecting upwardly from this flat top is a circular pin riding in a corresponding aperture in the top sill so as to serve the dual function of laterally and longitudinally locating the suspension unit in relation to the vehicle and also operating as a bump stop.

By the present invention an improved axle mounting and suspension for vehicles is obtained.

It will be appreciated that where increased load bearing capacity and stability are required, the rubber element may be laminated, successive laminations being bonded at other interfaces to metal or other plates.

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FIG. 1.

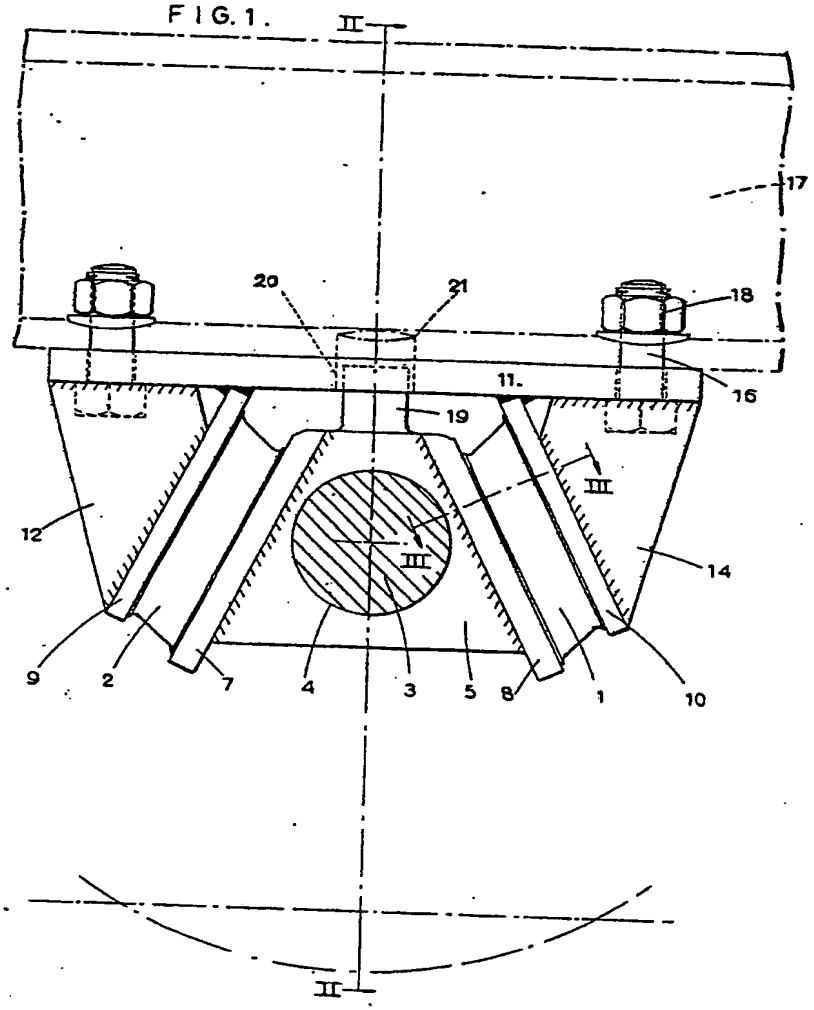
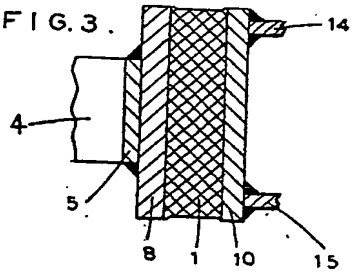


FIG. 3.



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2 SHEETS *This drawing is a reproduction of the Original on a reduced scale*

Sheets 1 & 2

FIG. 2.

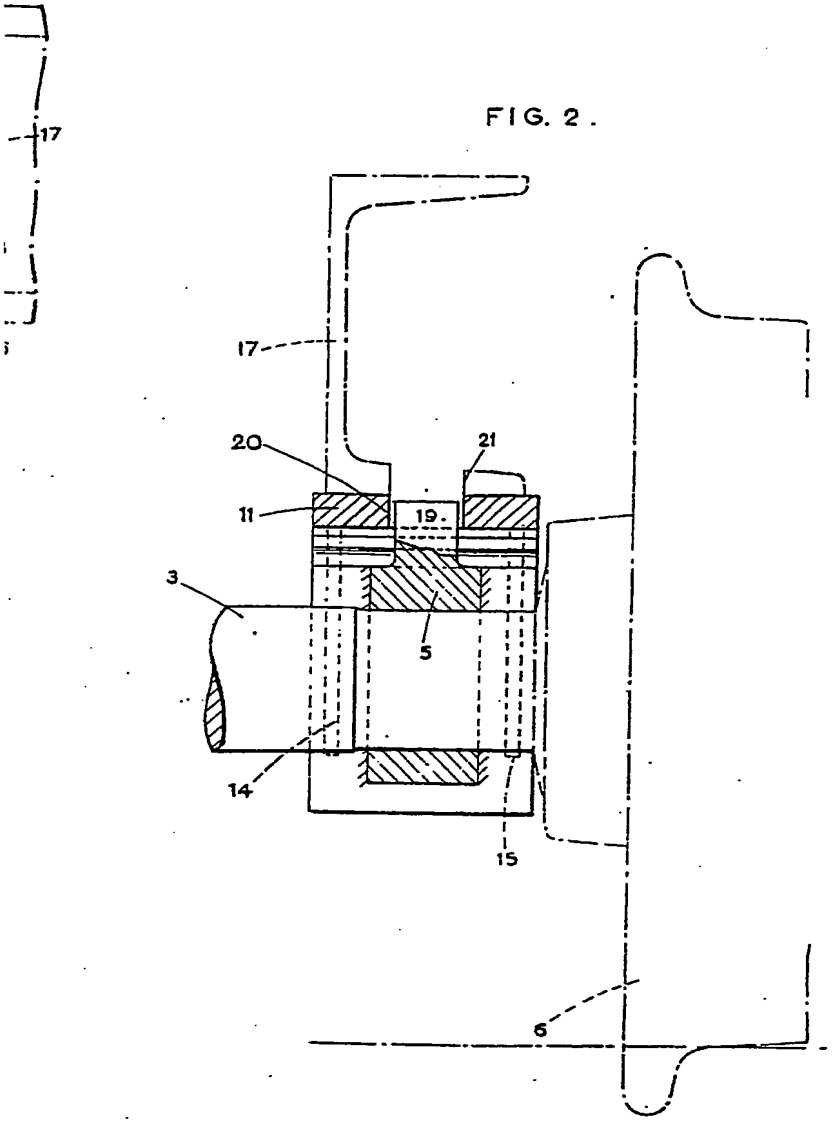

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FIG. 1.

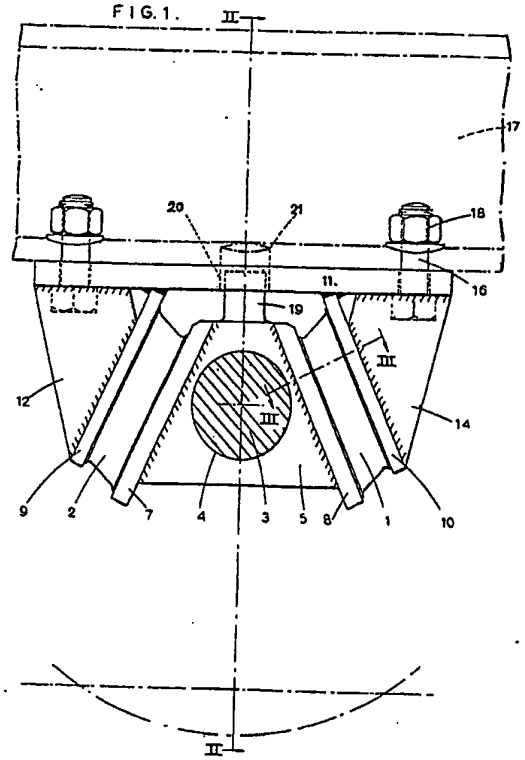

FIG. 2.

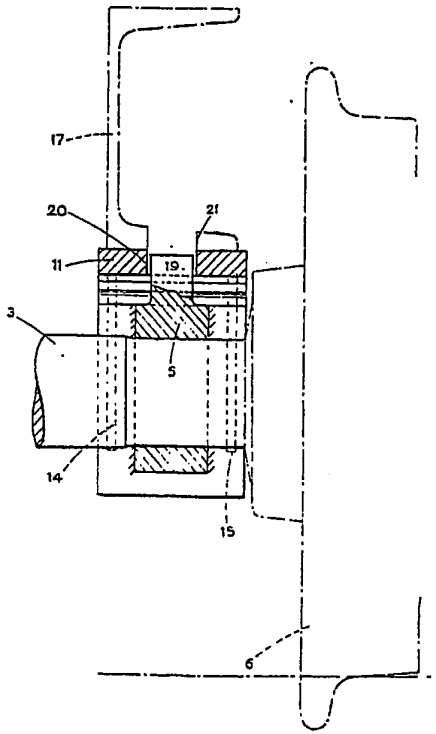

FIG. 3.